

Blue

Dart Aerospace Ltd.

10:37:32 AM

Process Sheet

Dart Helicopters Services

Drawing Name : 206L FWD X-TUBE

S.O. No. :

Part Number : D206667103BL

Drawing Number : D206-667-143 REV B

Project Number : N/A

Drawing Revision :

Material :

Due Date : 15/12/2008

Qty: 1 Um: Each

Prsnt Rev. : NC

1st Issue : 11

Previous Run : 43469

Written By :

Checked & Approved By :

Comment :

: Est Rev:F 05.09.01 Add holes for compatibility with Bell

Skidtubes KJ/JLM

Est Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD
verified by:

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description :

1.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-103 CHG003

2.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

3.0

D206667103TRN

Crosstube Turning Detail



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch 5-43524

PMB

08-12-03

4.0

BENDING

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per Dwg D206-667-143 using CNC bender program 206B-fw and Folio FT

PMB

8-12-3

5.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill holes & ream using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill all (3) top holes.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

RT

08-12-04

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
08-12-03	4.0	QC 15 required after bending. Perm. change	/	08-12-03	1	08-12-03	08-12-03
	4.1	QC 15					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
08-12-03	50	Tube is 0.220" short on the height. R.C. Process / program not perfect.... but close. Bench development.	/	Drill cuffs (Both) 0.220" however than nominal to put tube up to nominal height.	08-12-04	08-12-03	08-12-03	08-12-03
08-12-04	5	SMALL MARK ON SURFACE DISCOVERED NEAR SUPPORT LOCATION ON BOTTOM SURFACE OF TUBE. 08-12-04 MEASURED AFTER MARK BLENDED OUT. R.C. Piece of Aluminum was embedded the rollers during bending process.	08-12-04	ATTACHED SR SHOWS MARGIN STILL POSITIVE. ACCEPTABLE. MARK WAS AT 42.75" up from the RH cuff on the under side of the tube. rollers are cleaned before each use.	08-12-04	08-12-04	08-12-04	08-12-04

NOTE: Date & initial all entries into the material off of the rollers during bending process.

Date: Monday, 17/11/2008 10:37:32 AM
User: Julie Dawson

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 43470

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description:

4-Drill pilot holes using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill only the top (2) holes.

5-Drill pilot holes as per Dwg D206-667-143. Drill only the top (2) holes.

6-Drill Fwd rivet holes using drill Jig DT8787FWD as per Dwg D206-667-143.

Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT8787AFT as per Dwg D206-667-141.

8-C'sink holes as per Dwg D206-667-143. Allow rivet to sit below surface to compensate for paint.

9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-143

10-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-143

Inside of Cuff (Donot engrave on outside of tube)

RT 08-12-04

RT 08-12-04

6.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



AWN 8-12-05



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

7.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

S 08/12/05 (40)

8.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 08/12/05 (40)

9.0

OUTSIDE SERV.11

OUTSIDE SERVICE -CROSSTUBES



P/O: 7782 C208112/08 (1)



Comment: Sub-Contracting OUTSIDE SERVICE -CROSSTUBES

10.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

R 8/12/05 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Process Sheet

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Drawing Name: 206L FWD X-TUBE

Job Number: 43470

Part Number: D206667103BL

Job Number:



Seq. #:	Machine Or Operation:	Description :
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11.0	QC6	DIMENSIONAL CHECK
------	-----	-------------------



Comment: Inspect for damage & ensure results are as per Dwg D206-667-103

08/12/08 (X)

12.0	SPRAY PAINTING	SPRAY PAINTING
------	----------------	----------------



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2 - GREY

2-

-PAINT DELFLEET BLUE

-CLEAR DELFLEET

RT 08-12-11

13.0	QC14	INSPECT SPRAY PAINT
------	------	---------------------



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

ml

08 12 11

(1)

14.0	D3595075395	RUBBER CUSHION .75" x 3.95
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Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)
RUBBER CUSHION .75" x 3.95

1342998

ml

08 12 11

15.0	D2873043	Nut Plate Assembly
------	----------	--------------------



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
Pick:

Qty Part number Description Batch

2 D2873-043 Nut Plate 41988

RT 08-12-10

16.0	D2873045	Nut Plate Assembly
------	----------	--------------------



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
Pick:

Qty Part number Description Batch

2 D2873-045 Nut Plate 41987

RT 08-12-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 43470

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

17.0

D28911

2.25 Support



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2891-1

Support

43383

ml 08 12 11

18.0

MS20601AD4W8

RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number Description Batch

14 MS20601AD4W8

Rivet

109297

25 08-12-10

19.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-20

Clamp

181715

ml 08 12 11

20.0

CROSTUBES

CROSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Magnabond B# 109900 exp: 2010/02

1-Install abrasion strips as per QSI 035 using DT6579. Note: (2) Aft holes should be facing up.

2-Install supports and clamps as per Dwg D4206-667-143. Torque clamps to 80-100 in lb

3-Install nut plates as per Dwg D206-667-143. Touch-up rivet heads with Imron paint.

ml 08 12 11 ①

ml 08 12 12 ①

25 08-12-10

21.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

08-12-12 ①

22.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
08-12-12	20.0	Add Hagnnbanel to sequence, as per chwy. Perm. Change	<i>[Signature]</i>	08/12/15		<i>[Signature]</i> 08/12-12	<i>[Signature]</i> 08-12-12	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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NOTE: Date & initial all entries

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Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 43470

Part Number: D206667103BL

Job Number:



Seq. #:	Machine Or Operation:	Description :
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23.0	AN532A	Bolt
------	--------	------



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: M109282

SD

24.0	MS21042L5	Nut
------	-----------	-----



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut

Batch: M109297

SD

25.0	AN57A	Bolt
------	-------	------



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Pick:Packing Kit

Qty Part number

Description Batch

10 AN5-7A

Bolt

M109061

M109152

SD

26.0	AN530A	BOLT
------	--------	------



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:Packing Kit

Qty Part number

Description Batch

4 AN5-30A

Bolt

M105144

SD

27.0	AN960JD516	Washer
------	------------	--------



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Pick:Packing Kit

Qty Part number

Description Batch

18 AN960JD516

Washer

M109282

8/12/12

SD

28.0	QC4	INSPECT 100% KITS FOR COMPLETENESS
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Comment: INSPECT 100% KITS FOR COMPLETENESS

29.0	PACKAGING 1	PACKAGING RESOURCE #1
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Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D206-667-103

Location:

PPP Rev:

Rev C

SS 8/12/12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Date: Monday, 17/11/2008 10:37:32 AM
User: Julie Dawson

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 43470

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

30.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

31.0

EMP COST ADJ

Employee Labour Cost Adjustment



Comment: Sub-Contracting Employee Labour Cost Adjustment

Done 12/12

Job Completion



40842-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

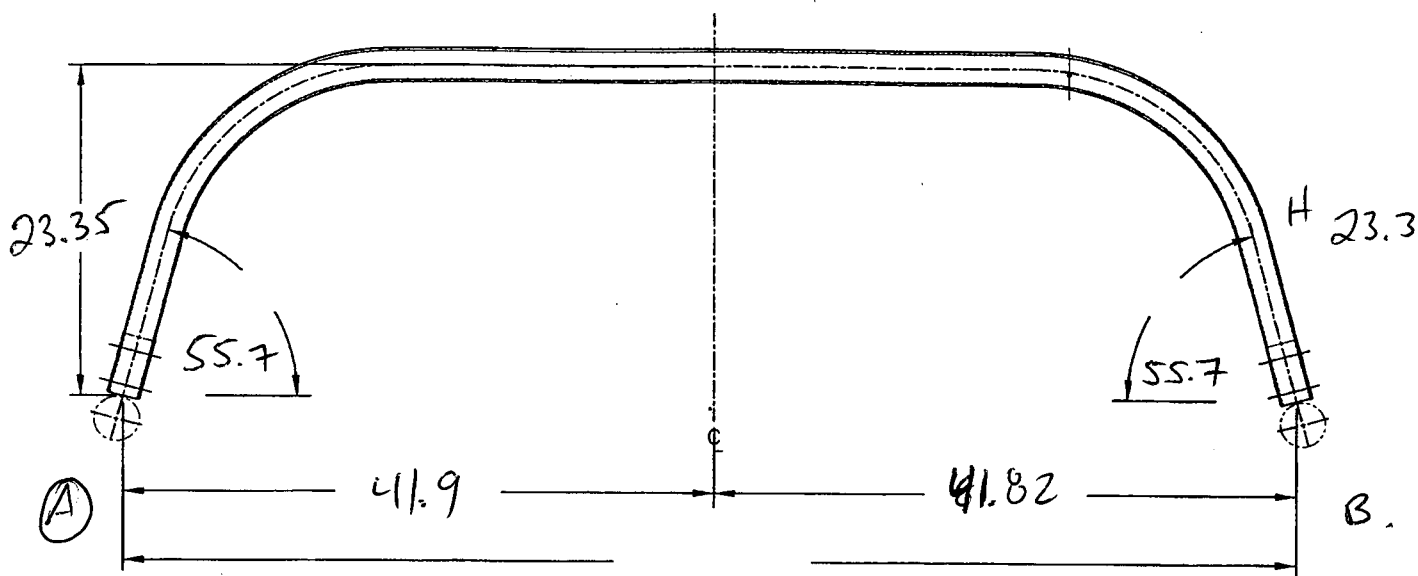
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	43470
Description: Crosstube High Fwd (206L)		Part Number:	D206-667-103
Inspection Dwg: D206-667-143 Rev: B		Page 1 of 1	

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	41.86	41.98
Angle	54	56
Total Span	83.72	83.96



Comments
Drill cuffs 0.220" lower to make tube sit at nominal height.

QC15 Inspection	ASI 042
Date	08.12.03

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	<i>[Signature]</i>

Item	Qty -143	Part Number	Description
1	X	D206-667-143	CROSSTUBE ASSEMBLY (206L HIGH FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6002-115
FINISHED LENGTH = 104.98±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-143" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 15.5 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
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WITHOUT NOTICE
WORK ORDER
NO. 43470

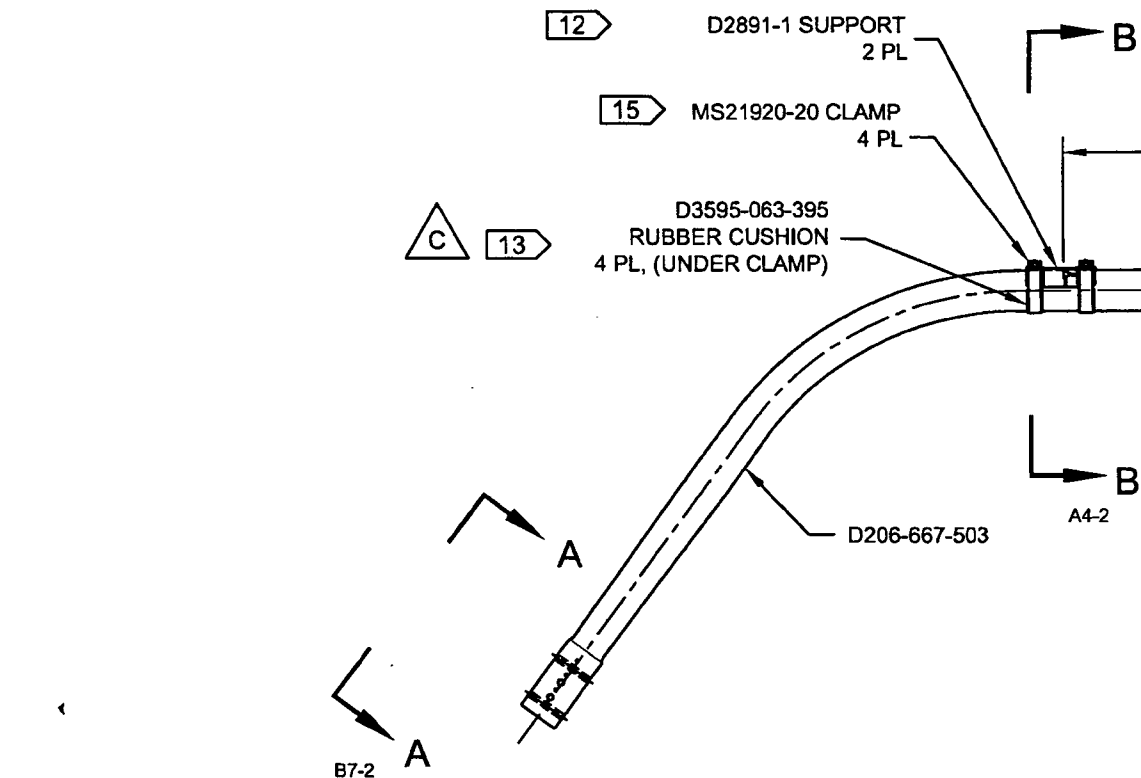
RELEASED
08/11/06

C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-395 WAS D2856-400-694 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCE (ZN D3-3, C4-3, C5-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKUDTUBES	PH	05.07.26
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	RF	DRAWING NO.	REV. C
MFG. APPR.	RF	D206-667-143	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (206L HIGH FWD)	NTS
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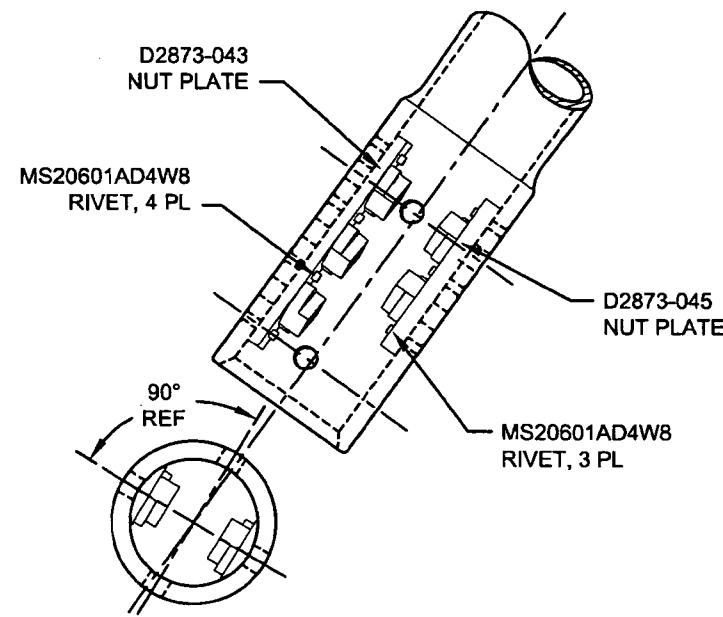
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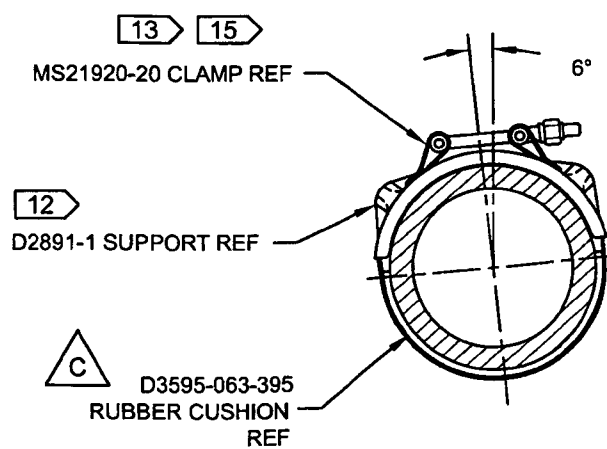
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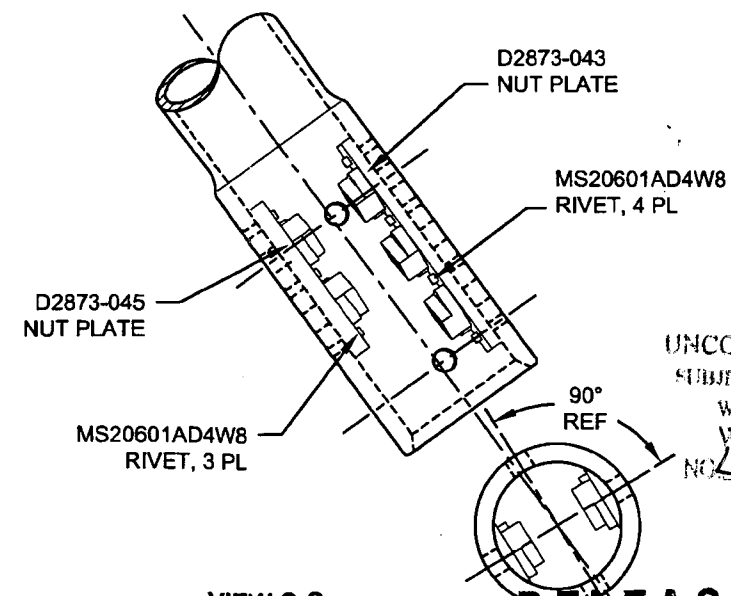
D206-667-143
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



VIEW A-A:
CUFF DETAIL
SCALE 4X



SECTION B-B
SCALE 5X



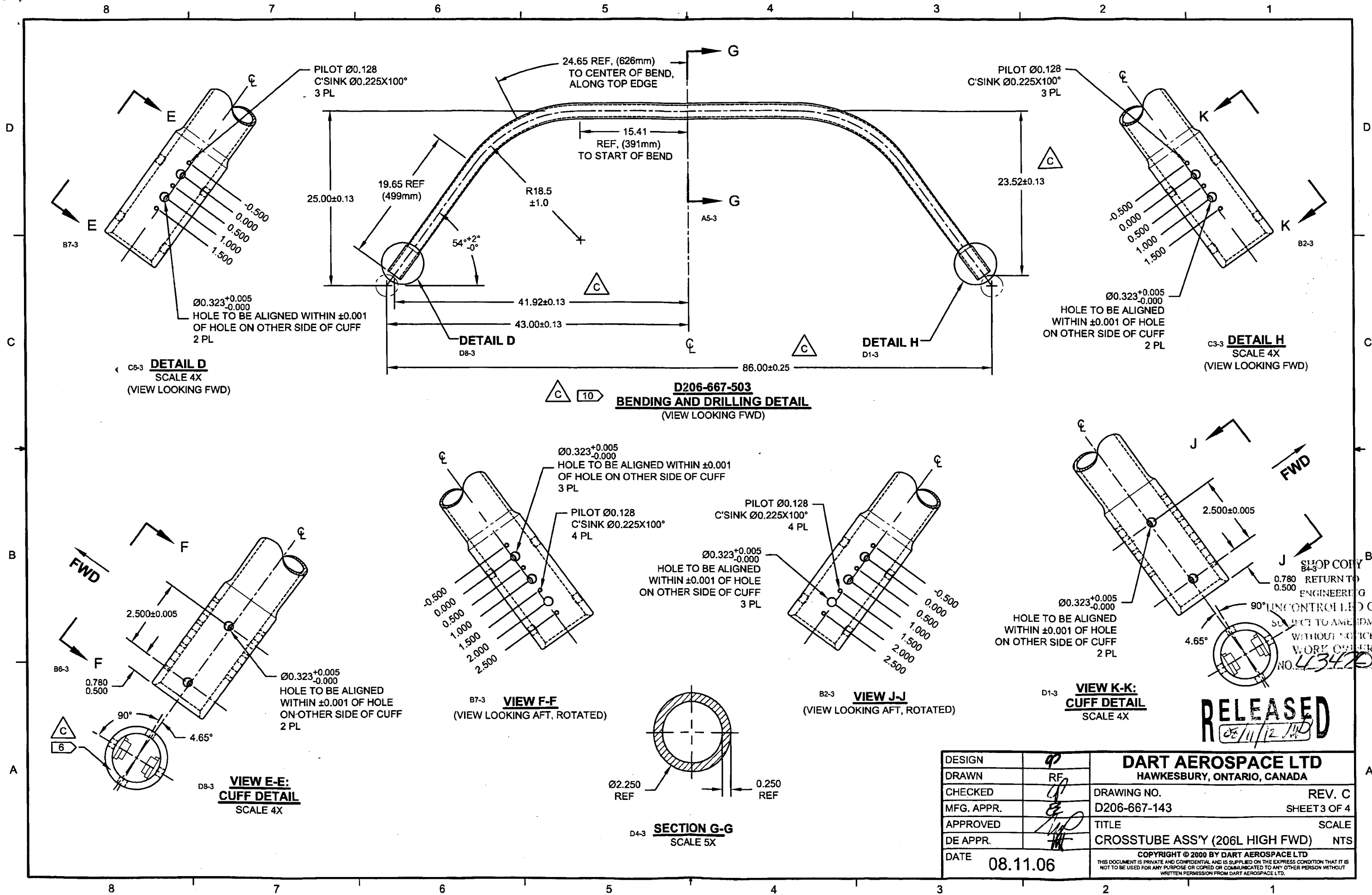
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CUFF DETAIL
SCALE 4X

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WORK ORDER
NO. 43470

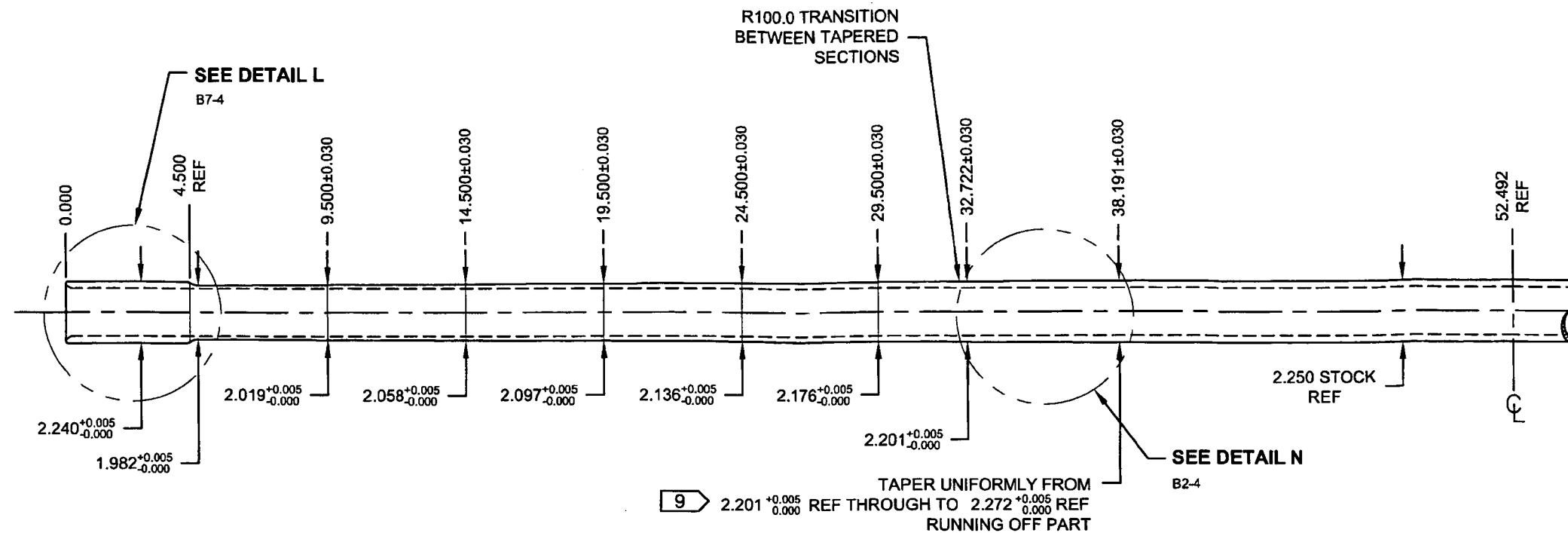
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08/11/2006

DESIGN	qp	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. C
MFG. APPR.	JP	D206-667-143	SHEET 2 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE ASS'Y (206L HIGH FWD)	NTS
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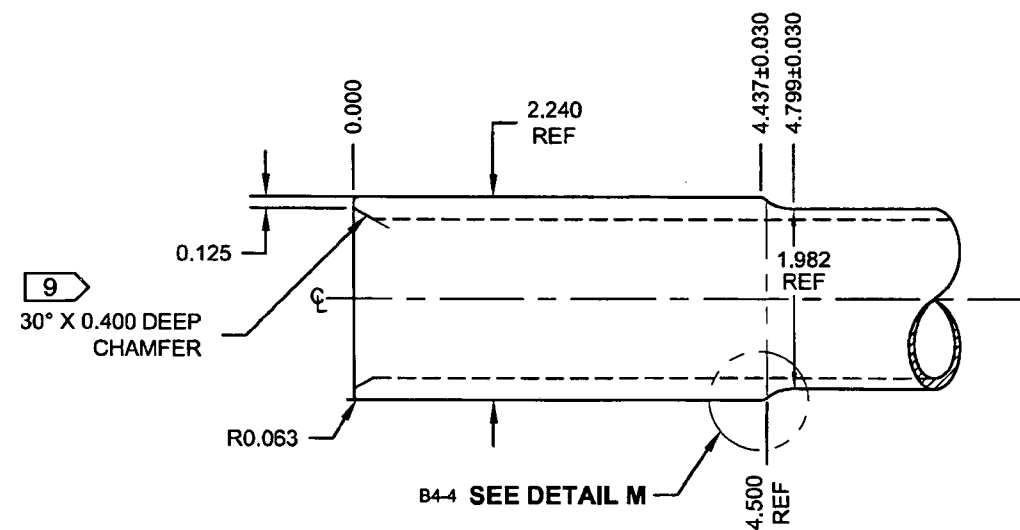
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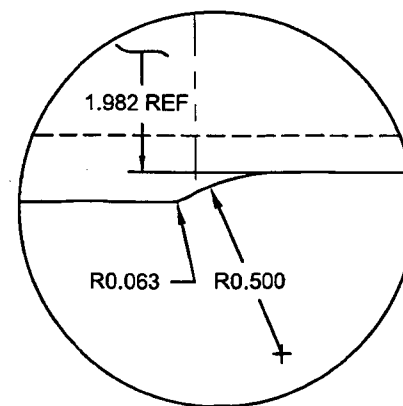
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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. C
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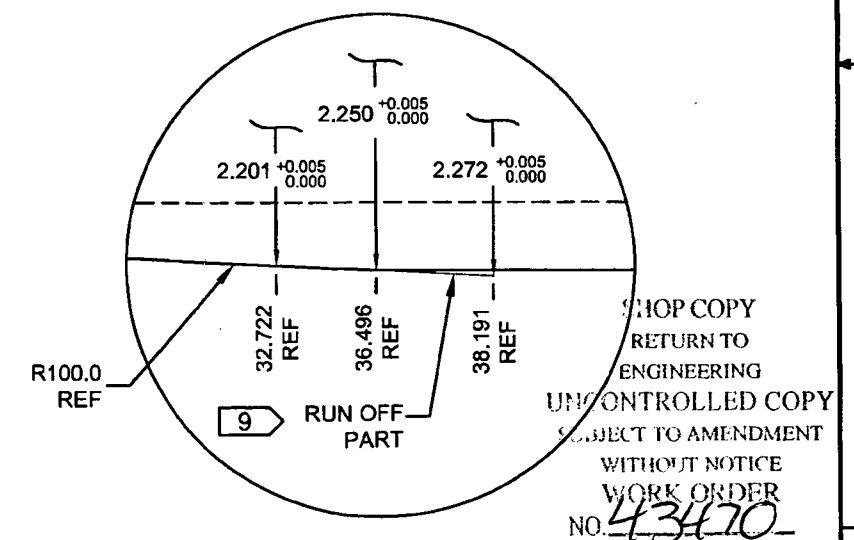
TURNING DETAIL



**DETAIL L:
CROSSTUBE CUFF**
NOT TO SCALE
D7-4








**DETAIL M:
CUFF TRANSITION**
NOT TO SCALE
A6-4



**DETAIL N:
TAPER RUN-OFF**
NOT TO SCALE
C4-4

RELEASED
08/11/06

DESIGN		DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. C
MFG. APPR.		D206-667-143	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L HIGH FWD)	NTS
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2247 Ver
2.248 Hor

0.040

1.222

FOR

DZ06-667-103

WAS 2.250

SECTION	Cross tube	Damage Tolerance	O.D. (in)	I.D. (in)	Area (in ²)	Inertia (in ⁴)
A-A	Bell Fwd	0.000	2.250	1.750	1.571	0.798
	Bell Fwd w/ dam. tol.	0.005			1.566	0.791
	Dart Fwd	0.000	2.225	1.750	1.483	0.743
	Dart Fwd w/ dam. tol.	0.015			1.407	0.697
B-B	Bell Fwd	0.000	2.207	1.750	1.420	0.704
	Bell Fwd w/ dam. tol.	0.005			1.415	0.698
	Dart Fwd	0.000	2.201	1.750	1.400	0.692
	Dart Fwd w/ dam. tol.	0.015			1.324	0.646
C-C	Bell Fwd	0.000	2.173	1.750	1.303	0.634
	Bell Fwd w/ dam. tol.	0.005			1.298	0.628
	Dart Fwd	0.000	2.167	1.750	1.283	0.622
	Dart Fwd w/ dam. tol.	0.015			1.207	0.577
D-D	Bell Fwd	0.000	2.139	1.750	1.188	0.567
	Bell Fwd w/ dam. tol.	0.005			1.183	0.561
	Dart Fwd	0.000	2.133	1.750	1.168	0.556
	Dart Fwd w/ dam. tol.	0.015			1.092	0.511
E-E	Bell Fwd	0.000	2.105	1.750	1.075	0.503
	Bell Fwd w/ dam. tol.	0.005			1.070	0.498
	Dart Fwd	0.000	2.099	1.750	1.055	0.492
	Dart Fwd w/ dam. tol.	0.015			0.979	0.448
F-F	Bell Fwd	0.000	2.045	1.750	0.879	0.398
	Bell Fwd w/ dam. tol.	0.005			0.874	0.393
	Dart Fwd	0.000	2.039	1.750	0.860	0.388
	Dart Fwd w/ dam. tol.	0.012			0.787	0.348
G-G	Bell Fwd	0.000	1.986	1.750	0.692	0.303
	Bell Fwd w/ dam. tol.	0.005			0.687	0.298
	Dart Fwd	0.000	1.982	1.750	0.680	0.297
	Dart Fwd w/ dam. tol.	0.012			0.607	0.258
H-H	Bell Fwd	0.000	2.250	1.750	1.571	0.798
	Bell Fwd w/ dam. tol.	0.005			1.566	0.791
	Dart Fwd	0.000	2.240	1.750	1.536	0.775
	Dart Fwd w/ dam. tol.	0.030			1.445	0.710

SECTION **	Cross tube	Bending Ultimate (lb*in)	Bending Yield (lb*in)	Tension Ultimate (lb)	Tension Yield (lb)	Shear Ultimate (lb)
A-A	Bell fwd w/ DT	46425	39391	103343	87685	65763
	Dart fwd w/ DT	48227	41618	108347	92869	57691
	Margin of Safety	0.04	0.06	0.05	0.06	-0.12
B-B	Bell fwd w/ DT	41755	36429	93408	79255	59442
	Dart fwd w/ DT	45190	39000	101923	87363	54271
	Margin of Safety	0.08	0.10	0.09	0.10	-0.09
C-C	Bell fwd w/ DT	38160	32378	85689	72705	54529
	Dart fwd w/ DT	40996	35384	92942	79664	49488
	Margin of Safety	0.07	0.09	0.08	0.10	-0.09
D-D	Bell fwd w/ DT	34649	29399	78089	66257	49693
	Dart fwd w/ DT	36898	31851	84100	72086	44781
	Margin of Safety	0.06	0.08	0.08	0.09	-0.10
E-E	Bell fwd w/ DT	31219	26489	70609	59911	44933
	Dart fwd w/ DT	32895	28398	75398	64627	40147
	Margin of Safety	0.05	0.07	0.07	0.08	-0.11
F-F	Bell fwd w/ DT	25360	21518	57702	48959	36719
	Dart fwd w/ DT	26286	22664	60614	51955	32275
	Margin of Safety	0.04	0.05	0.05	0.06	-0.12
G-G	Bell fwd w/ DT	19828	16824	45374	38499	28874
	Dart fwd w/ DT	20027	17271	46754	40074	24895
	Margin of Safety	0.01	0.03	0.03	0.04	-0.14
H-H	Bell fwd w/ DT	46425	39391	103343	87685	65763
	Dart fwd w/ DT	48829	42421	111242	95350	59233
	Margin of Safety	0.05	0.08	0.08	0.09	-0.10

- Excerpt from SR-DZ06-667-2
- OD WAS REDUCED TO 2.225 TO ACCOUNT FOR MEASURED OD OF 2.240 + 0.015 ALLOWABLE DMG. MARGIN STILL POSITIVE.
- CALC CONSERVATIVE BECAUSE IT FURTHER CONSIDERS TOL. ON OD & DMG. IE. DMG OF 0.015 IS BEING APPLIED TWICE. BY THE TABLE EXCEL TABLE.
- 30 TUBE OK 4/08.12.04



LIQUID PENETRANT TEST REPORT

P- 09133

PAGE 1 OF 1

CLIENT Dart Aerospace DATE Dec 5th 2008 TIME AM ☐ PM ☐
ATTENTION Linda Lacelle ACUREN JOB NO. 188-08-1626
ADDRESS 1270 Aberdeen POWO No. _____
Hawkesbury, Ont. WORK LOCATION Hawkesbury
ACCEPTANCE STD. ASTM 1417 REV./DATE _____
PROJECT 206L FWD X-TUBE
ITEM(S) EXAMINED Job #'s 43469, 43470, 43471, 43472, 43491, 43492

JOB DESCRIPTION	PROCEDURE No. <u>LT-000</u> REV./DATE	TECHNIQUE No. <u>LT-000</u> REV./DATE
PART No. <u>D206667103 BL</u>	MATERIAL <u>ALODINE ALUM.</u> THICKNESS	
SCOPE <u>WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT ON</u> <u>100% EXTERNAL SURFACE</u>		
TEST DETAILS		
METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED	
FAMILY BRAND <u>Magnaflux</u>	BLACK LIGHT S/N <u>0171</u> <input type="checkbox"/> OUTPUT > 1000 μ W/cm ² <input type="checkbox"/> AMBIENT < 2 fc	
PENETRANT	MINIMUM DWELL TIME <u>30</u> MIN.	LIGHTING EQUIP. <input checked="" type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER <u>H₂O</u>	MINIMUM DRY TIME <u>>10</u> MIN.	OTHER <u>CAL FEB 09</u>
DEVELOPER <u>EK D52</u>	MINIMUM DWELL TIME <u>10</u> MIN.	LIGHT METER S/N
DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	CAL DUE DATE	

TEST SURFACE			
SURFACE CONDITION <input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED <input type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input checked="" type="checkbox"/> CLEAN BARE METAL			
SURFACE TEMPERATURE <input type="checkbox"/> < -4°C/ 20°F <input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F <input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F			

RESULTS- (<input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL)		ACCEPT	REJECT
ITEM	COMMENTS		
Job #'s 43469:		✓	
43470:		✓	
43471:		✓	
43472:		✓	
43491:		✓	
43492:		✓	
06/12/09			

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE <u>Melanie Fautoux</u>	DTR #
TECHNICIAN (SIGNATURE): <u>Frederick Chagnon</u>	REPORT REVIEWED BY:
NAME (PRINT): <u>Frederick Chagnon</u>	NAME INITIALS
CGSB LEVEL <u>II</u> SNT LEVEL <u>II</u> CGSB REG. No. <u>10560</u>	CGSB LEVEL _____ SNT LEVEL _____ CGSB REG. No. _____

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

Date: Wednesday, 19/11/2008 8:59:38 AM
User: Julie Dawson

Process Sheet

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Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: 206L FWD X-TUBE
Job Number	: 43470		
Estimate Number	: 10553		
P.O. Number	:	Part Number	: D206667103BL
This Issue	: 19/11/2008	S.O. No. :	Drawing Number : D206-667-143 REV B
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: 17/11/2008	Type : CROSSTUBES	Drawing Revision :
Previous Run	: 43469	Material	:
Written By	:	Due Date	: 15/12/2008
Checked & Approved By	:	Qty:	1 Um: Each
Comment	: Est Rev:F 05.09.01 Add holes for compatibility with Bell Skidtubes KJ/JLM Est Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD verified by:		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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JUD 08.12.05



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-103 CHG003

2.0	PACKAGING 1	PACKAGING RESOURCE #1
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Comment: PACKAGING RESOURCE #1

3.0	D206667103TRN	Crosstube Turning Detail
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch _____

Job Completion

